

CLAIMS:

1. A battery module, which forms an item unit for construction of a battery assembly, comprising:
 - a cell unit having a plurality of cells;
 - a housing and a cover to store the cell unit; and
 - a shaft member inserted into a through-hole provided in the cell unit and a through-hole provided in the housing and a through-hole provided in the cover, wherein the shaft member comprises a length that allows protrusion from each of the housing and the cover.
2. The battery module of claim 1, further comprising a lock to lock the shaft member to the housing or to the cover.
3. The battery module of claim 2, wherein the lock comprises a fastening member provided at an area where the shaft member protrudes from the cover, wherein the fastening member is fastened to the cover.
4. The battery module of claim 2, wherein the lock comprises a lock member provided at an area where the shaft member protrudes from the housing, wherein the lock member is locked to the housing.
5. The battery module of claim 4, wherein the lock member has a structure that is free to move between a first position where insertion into the through-hole of the cell unit and into the through-holes of the housing and the cover is allowed and a second position where separation of the cell units and the housing and the cover from the shaft member is prevented.
6. The battery module of claim 4, wherein the shaft member doubles as a jig for insertion of the cover, the cell unit, and the housing in said order from the lock member side toward the fastening member at the time of assembly of the battery module.

7. The battery module of claim 4, wherein the lock member is free to move between a first position and a second position as the lock member undergoes elastic displacement in the direction of an axis of the shaft member.
8. The battery module of claim 4, wherein the lock member is free to move between the first position and second position as the lock member undergoes rotation with an axis of the shaft member as the center.
9. The battery module of claim 1, wherein the cover and the housing are mutually locked as an edge member of the housing forms a seam with an edge member of the cover.
10. The battery module of claim 1,
wherein the shaft member is a first shaft member of a first module, further comprising an interfitting member formed on both end faces of the first shaft member in the axis direction; and
wherein the axis of the first shaft member and an axis of a second shaft member of a second battery module are matched at the time of connecting the second shaft member along the axis direction as the first shaft member is fitted at an interfitting member of the second shaft member.
11. The battery module of claim 10,
wherein the battery module is formed into a battery module arrangement comprising a plurality of battery modules by stacking the battery modules where the interfitting members of the shaft members are locked; and
wherein a support structure supports the battery modules from both sides of the battery module arrangement when the shaft members with locked interfitting members are locked, thereby forming the battery assembly.
12. The battery module of claim 11, wherein the shaft member regulates a gap between the battery module and a second battery module when the interfitting members are in a fitted state.

13. The battery module of claim 11, wherein the shaft members are hollow and wherein a center hole is the through-hole and the support structure includes a fastening bolt.

14. A battery assembly comprising:

a plurality of battery modules wherein an axis of a first shaft member of a first battery module and an axis of a second shaft member of a second battery module are matched at the time of connecting the second shaft member along the axis direction as the first shaft member is fitted at an interfitting member of the second shaft member, and wherein the plurality of battery modules are stacked where each battery module's interfitting member of a shaft member are locked; and

a support structure that supports the battery modules from both sides of the plurality of battery modules when each of the battery module's interfitting members are locked.

15. The battery system of claim 14, wherein the shaft members regulate a gap between each of the battery modules when the interfitting members are in a fitted state.

16. The battery system of claim 14, wherein the shaft members are hollow and wherein a center hole is a through-hole and the support structure includes a fastening bolt.

17. The system of claim 14, wherein each of the battery modules comprises:
 - a cell unit having a plurality of cells;
 - a housing and a cover for storing the cell unit;
 - a shaft member inserted into a through-hole provided in the cell unit and a through-hole provided in the cover and a through-hole provided in the housing, wherein the shaft member comprises a length that allows protrusion from each of the cover and the housing;
 - a fastening member, provided at an area where the shaft member protrudes from the cover, wherein the fastening member is fastened to the cover; and
 - a lock member, provided at an area where the shaft member protrudes from the housing, wherein the lock member is locked to the housing, and wherein the lock member has a structure that is free to move between a first position where insertion into the through-hole of the cell unit and into the through-holes of each of the cover and of the housing is allowed and a second position where separation of the cell units, the cover, and the housing from the shaft member is prevented, and wherein the shaft member doubles as a jig for insertion of the cover, the cell unit, and the housing in said order from the lock member side toward the fastening member at the time of assembly of the battery module.

18. A method of manufacturing a battery module comprising:
 - storing a cell unit, which contains a plurality of battery cells, within a housing having a cover to form a storage space;
 - inserting a shaft member into a through-hole provided in the cell unit and a through-hole provided in the cover and a through-hole provided in the housing, wherein the shaft member comprises a length that allows protrusion from each of the cover and the housing;
 - fastening a fastening member to the cover at an area where the shaft member protrudes from the cover;
 - locking a locking member to the housing at an area where the shaft member protrudes from the housing, such that the lock member is free to move between a first position where insertion into the through-hole of the cell unit and the through-holes of each of the cover and housing is allowed and a second position where separation of the cell units and each of the cover and housing from the shaft member is prevented; and
 - inserting the cover, the cell unit, and the housing in said order onto the shaft member from the lock member side toward the fastening member, wherein the shaft member doubles as a jig.

19. The method of claim 18, further comprising mutually locking the cover to the housing wherein an edge member of the housing forms a seam with an edge member of the cover.

20. A method of manufacturing a battery assembly comprising:
 - matching an axis of a first shaft member of a first battery module and an axis of a second shaft member of a second battery module at the time of connecting the second shaft member along the axis direction as the first shaft member is fitted at an interfitting member of the second shaft member;
 - stacking a plurality of battery modules where each battery module's interfitting member of the shaft member are locked; and
 - inserting the plurality of battery modules into a support structure that supports the battery modules from both sides of the plurality of battery modules when each of the battery module's interfitting members are locked.

21. The method of claim 20, further comprising regulating a gap between the battery modules with the shaft members when the interfitting members are in a fitted state.
22. The method of claim 20, further comprising fastening a fastening bolt to the shaft member.
23. A battery module, which forms an item unit for construction of a battery assembly, comprising:
 - means for enclosing a plurality of cells;
 - a shaft member inserted into a through-hole provided in the cell unit and a through-hole provided in the enclosing means, wherein the shaft member comprises a length that allows protrusion from the enclosing means; and
 - means for locking the shaft member to the housing or to the cover.